Saint Petersburg State University
Graduate School of Management
Master in Corporate Finance

RELATIONSHIP BETWEEN THE LEVEL OF DEBT AND EARNINGS MANAGEMENT OF RUSSIAN COMPANIES

Master's Thesis by the 2nd year student
Concentration – Master in Corporate Finance
Anastasiia Poberezkaia

Research Advisor:

Egor D. Nikulin, Associate Professor,
Department Finance and Accounting

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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

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АННОТАЦИЯ

Автор	Поберезкая Анастасия Дмитриевна
Название магистерской диссертации	Взаимосвязь уровня долга и манипулирования прибылью российских компаний
Факультет	Высшая Школа Менеджмента
Направление подготовки	Менеджмент (Профиль: Корпоративные финансы)
Год	2021
Научный руководитель	Никулин Егор Дмитриевич
Описание цели, задач и основных результатов	Основная цель исследования - определить взаимосвязь между уровнем долга и манипулированием прибылью в российских компаниях. Используя дискреционные начисления в качестве прокси для манипулирования прибылью, была разработана линейная регрессионная модель для выявления связи между переменными. Для расчета дискреционных начислений использовалась Модифицированная Модель Джонс (1995). Выборка включает 173 компании. Анализируемый временной период составляет девять лет, а именно 2011-2019 годы. В анализе рассматривается 1 557 наблюдений. В работе было проведено различие между долгосрочным и краткосрочным долгом и включено в анализ. Результаты анализа показывают положительную взаимосвязь между уровнем совокупного долга и краткосрочного долга с манипулированием прибылью. Взаимосвязи между долгосрочным долгом и манипулированием прибылью выявлено не было. Для проверки модели были проведены дополнительные тесты на подвыборках по отраслям и финансовому положению. Модель лучше всего работает для производственных отраслей и фирм, находящихся в здоровом экономическом положении.
Ключевые слова	Манипулирование прибылью, уровень долга, дискреционные начисления

ABSTRACT

Master Student's Name	Poberezkaia Anastasiia
Master Thesis Title	Relationship between the Level of Debt and Earnings Management of Russian Companies
Faculty	Graduate School of Management
Main field of study	Management (specialization: Master of Corporate Finance)
Year	2021
Academic Advisor's Name	Egor D. Nikulin, Associate Professor, Department Finance and Accounting
Description of the goal, task and main results	The main research goal is to determine the relationship between the level of debt and earnings management in the Russian companies. Using discretionary accruals as a proxy for earnings management a linear regression model was designed to capture the relation between the variables. The Modified Jones model, proposed by Dechow, Sloan and Sweeney (1995), was used to calculate discretionary accruals. The sample includes 173 companies. The analyzed time period is nine years, specifically 2011-2019. In the following analysis 1,557 firm-years observations are considered. Distinction between different debt maturity was included in the analysis. The findings of the analysis show positive relationship between the level of total debt and short-term debt with earnings management. No relationship between long-term debt and earnings management was identified. Additional tests on subsamples by grouped industries and firms under financial distress were made to check the model. The model works best for production industries and firms in a healthy economic position.
Keywords	Earnings management, level of debt, discretionary accruals

Table of contents

INTRODUCTION

This paper is devoted to the consideration of the issues of Earnings Management. Earnings Management is a fairly modern phenomenon that has occurred in recent decades. New ideas are penetrating into this theory under the influence of globalization. It remains one of the most controversial topics in modern financial theories or accounting. Accounting procedures permit managers to apply their judgment and make subjective assessments, to some extent, in the preparation of financial statements. If used properly, this freedom can be useful in the process of increasing the relevance and reliability of financial reporting and minimizing information asymmetries. Conversely, opportunistic use of this freedom can contribute to the exact opposite result - decreased relevance and reliability of financial reporting, and greater asymmetry of information.

Many earlier as well as current studies show the importance of introducing earnings management. Most of them focus mainly on developed countries, for developing countries these studies are not yet as widely implemented in academia, so there remains an open research gap. For the local market, there have not yet been studies that describe the relationship of debt levels and accrual earnings management. Overall, the literature is plentiful, but there are conflicting results, which makes it interesting to conduct my own research to find out what the outcome will be for our market.

The literature on earnings management attempts to understand why managers manipulate earnings, how it relates to key indicators, how they do it and where it can lead to. These questions are the focus of an important area of financial reporting research. In the literature, there are many opposing views and results on similar issues (Rodríguez-Pérez, Debt, diversification and earnings management, 2010). Positive accounting theory has identified some key incentives for earnings management, such as debt covenants, management compensation contracts, and political costs. Thus, the relationship between debt contracts and opportunistic earnings manipulation points to a possible relationship between debt policy and earnings management. In this context, several studies have sought to examine this relationship and offer mixed results. On the one hand, some studies show that debt is positively related to earnings management when firms want to reduce the likelihood of violating debt covenants and improve the firm's bargaining position on debt. On the other hand, other studies have found a negative relationship between debt levels and earnings management, suggesting that managers of firms with higher levels of debt may face scrutiny from creditors, making it difficult for them to participate in earnings management. These different conclusions about the relationship between debt levels and earnings management can be explained by differences in the legal system or the level of economic development of the country. Hence, the

theoretical debate and the divergence of empirical results explain the complexity and importance of this topic. Additional international data can make a useful contribution to explaining differences across countries. Thus, the impact of debt levels on income management requires new research to provide the necessary answers. In my research I have the intention to study the issue of debt ratios and their impact on the earnings management using the local market as an example.

Earnings management can be broadly defined as an accounting profit strategy that is based on management's discretionary power to make accounting decisions. Earnings management is the set of actions that affect the reported accounting profit or its interpretation, starting with the production and investment decisions that partially determine the underlying economic profit, going through the choice of accounting methods and the amount of accruals in the preparation of periodic reports, and ending with actions that affect the interpretation of reported profit (Ronen, Earnings management, 2008).

There are several categories of users of earnings reporting information:

- Shareholders
- Bondholders and other creditors
- Regulators
- Employees
- Competitors, suppliers, and customers (Ronen, 2008).

If we talk about equity, this category has been studied quite deeply, namely, debt issues require more in-depth analysis, especially such studies in our market are very few and the topic requires further development and expansion.

There are already conducted studies on the topic that examine existence of relationship between leverage and the level of company’s earnings management, but there is a lack of those for our local market. The key to this study emphasizes the existing studies and their contributions to the development of the topic, and provides the results of my work in the context of this topic for our region.

Research gap:

At the moment there are already implemented researches for various markets, but for Russia this topic is poorly investigated and requires further development. Thus, this research will contribute to the development of the general subject of earnings management, specifically on the

relationship between the level of debt and EM in the local market and will also complement the literature on this topic with more specific information on our region.

The main research goal is to determine the relationship between level of debt and earnings management in the Russian companies.

Research Questions:

- In which manner does the level of debt affects earnings management?
- How does the implication of long-term debt and short-term debt levels on earnings management differ?
- What are the additional factors to consider when analyzing the relations between debt and earnings management?

Managerial implications:

This research is primarily intended for external users of accounting information. This category primarily includes investors and creditors. Therefore, the results are aimed at those who lend to companies, primarily banks. The results of the research will help to understand the essence of the problem, understand the conditions under which companies manipulate financial statements and take this into account when making decisions about entering into debt relations.

Thesis structure

The first chapter is mainly devoted to an analysis of the theoretical framework of earnings management. The chapter discusses the concept of earnings management and motives for engaging in earnings manipulation, as well as a review of prior research on the topic. The chapter also describes the development of hypotheses and describes the models that are used to calculate accrual earnings management.

The second chapter describes the empirical study itself. It includes a description of the data collection and analysis, a discussion of the underlying model and its variables. In addition, descriptive statistics of the variables and results of the study and additional tests are also included.

Conclusions and managerial implications of the study are then described.

CHAPTER 1. THEORETICAL FRAMEWORK OF EARNINGS MANAGEMENT

1.1. Concept of Earnings Management

Earnings management can be generically defined as a strategy for generating accounting gains, which is carried out based on management's discretionary authority over accounting choices and cash flows from operating activities (Ronen, 2008). According to Paul M. Healy and James M. Wahlen (1999), earnings management takes place when managers use judgment in financial reporting and in structuring transactions to modify financial statements, either to mislead certain stakeholders about the baseline economic performance of the company or to influence contractual outcomes that depend on the reported data.

Certain points of this definition are worthy of discussion. First, there are many ways in which managers can make judgments in financial reporting. For example, judgment is needed to estimate many future economic events, such as the expected life and residual values of long-lived assets, pension and other post-employment benefit obligations, deferred taxes, and losses on doubtful debts and asset impairments. In addition, managers must apply judgment in managing working capital. Managers must also decide whether to make or defer expenses such as research and development (R&D), advertising, or maintenance. Finally, they must decide how to structure corporate operations.

The second point to note is the following - the purpose of earnings management is to mislead stakeholders about the underlying economic performance of the firm. This can occur if managers believe that stakeholders, or some of them, do not undo earnings management. It can also occur if managers have access to information not available to external stakeholders, so that earnings management is likely not transparent to outsiders. In this case, stakeholders are likely to anticipate and may tolerate earnings management to some extent.

Managers can also exercise accounting judgment to make financial statements more informative to users. This can occur if certain accounting decisions or estimates are perceived as reliable signals about the firm's financial performance. In addition, managers can use accounting judgments to make financial statements more informative by overcoming the limitations of current accounting standards (Healy, 1999). However, decisions to use accounting judgment to make financial reporting more informative to users do not fall within the definition of earnings management for our use.

Earnings management is defined as the manipulation of earnings by using the discretion allowed by accounting standards and structuring the transaction so that the value of the firm is not

adversely affected (Mangala, 2017). EM is clearly distinct from fraud, as it carried out within GAAP. Fraud contrariwise violates GAAP. EM is divided into three units: conservative accounting, neutral earnings, and aggressive accounting. In conservative accounting, a manager uses some discretion in accounting, such as overly aggressive recognition of reserves or provisions, delayed sales, etc. Neutral earnings are the result of neutral business operations, and finally, aggressive methods, such as understating provisions and inventories and deferring research and development or advertising expenses, are used in aggressive accounting. Fraudulent accounting refers to the manipulation of earnings by violating accounting standards and/or structuring transactions to reduce firms' expected value (Dechow P. M., 2000).

Accrual earnings management and real earnings management are two techniques that can be used to manipulate earnings. A firm's accounting earnings consist of cash from operations and total accruals. Total accruals are the sum of discretionary and non-discretionary accruals. Discretionary accruals are not mandatory in nature and are based solely on the manager's choice, while non-discretionary accruals are mandatory in nature because they are derived from ordinary business transactions or past accounting transactions. Consequently, discretionary accruals are used as an earnings management tool, and they are used as a measure of earnings management (Mangala, 2017).

1.2. Motives for earnings management

Agency theory

When forming a hypothesis, references to agency theory are common. Agency theory used to explain earnings management. Jensen and Meckling (1976) define that agency relationship arises when one party empowers another party to perform work or services and gives the other party authority to make decisions (Jao & Pagalung., 2011). Earnings management arises due to agency relationships between shareholders (principal) and managers (agents). This agency relationship will create an agency conflict, because there is a difference of interests between the principal and the agent. This conflict will lead to information asymmetry because management does not report the information in an honest and transparent way to shareholders. Based on agency theory that the larger companies or other entities will face bigger information asymmetry (Jensen and Meckling., 1976). Large companies face larger agency conflicts which indicate that the possibility of opportunistic behavior will occur even greater.

Positive accounting theory

Another theory in use to explain motives is positive accounting theory. According to the paper "Positive Accounting Theory: A Ten Years Perspective" (Watts, 1990) there are three opportunistic perspectives on managerial incentives to manipulate accounting performance.

First one to be mentioned is *political cost hypothesis*. It states that companies with high profitability will tend to shift their income from present period to the coming periods to avoid political costs. Political costs are accrued because high profitability attracts the attention of consumers and the media. Also, it is stated that companies are more likely to have a greater incentive for income smoothing (specific form of earnings management) compared with small companies, as it has a greater political cost. Political costs occur high due to the profitability of the company that can attract the attention of the media and consumers (Moses, 1997).

Second one is *The Debt Agreement hypothesis.* It assumes that for companies that breach the debt agreement, the manager will be able to choose accounting procedures that carry forward future profits to the current period in order to increase net profits and ultimately avoid technical errors (Wiratama, 2020). In conducting a debt agreement, the company is required to fulfill several requirements submitted by the debtor in order to be able to apply the loan. Some requirements are for certain conditions regarding company finance. There is an incentive for manipulation to meet the expectations of creditors.

The third motive is not included in the field of my research and is a separate area of investigation of earnings management, nevertheless I consider it necessary to mention it for the purpose of disclosing the topic. *The bonus plan hypothesis* suggests that in order to get the bonus, managers will choose accounting procedures that allow future income to be carried over to the current period (Wiratama, 2020). Management who given promises to get a bonus related to the performance of the company will be motivated to recognize higher profits with the aim of getting higher bonuses, if they correspond to the company's performance.

Deepa Mangala and Isha (2017) after examining the literature on earnings management identified the following main motives or drivers behind the phenomenon: stock market motives, signaling / concealing private information, political cost, personal interest, internal motives, management compensation motives, lending contracts and regulatory motives. To generalize, researchers have grouped them into four main categories as follows:

- capital market drivers;
- management compensation contract drivers;
- external contracts drivers;
- regulatory & political costs drivers.

They partially overlap with those already named, but nevertheless I will briefly describe each category according to a different classification than was previously mentioned.

Capital Market Motives

Managers used earnings management techniques to manipulate accounting information in financial statements to achieve the goal of improving short-term stock price performance. Stock prices are sensitive to earnings metrics that help investors gauge a company's position in the market. For instance, in the paper of Teoh, Welch, and Wong (1998) «Earnings management and the long-run market performance of initial public offerings» authors discover that issuers of initial public offerings can report earnings in excess of cash flows by taking positive accruals. The article provides evidence of issuers with unusually high accruals in the IPO year experience poor stock return performance in three consequent years (Teoh, 1998). Another motive for companies to apply earnings management is to meet the expectations of stock market analysts. The reason is that investors often make decisions based on the expectations of stock market analysts (Mangala, 2017).

Management Compensation Contract Motives

Stands for the same idea as *bonus plan hypothesis.* Managers engage in accrual manipulation to drive earnings up or down to maximize their compensation because their bonuses are tied to company earnings. Thus, when earnings reach the limit of bonus compensation, managers employ earnings management techniques that reduce earnings. They may also carry over income in the current period to the next, since no additional bonuses are paid after that (Holthausen, 1995).

External Contracts Motives

Debt contracts, supplying contracts, dividend covenant etc. are included into external contracts. To regulate firms, lenders often impose certain financial constraints, such as maintaining a certain level of accounting data and ratios to ensure repayment of firms' borrowings. Thus, firms with a large share of debt in their capital structure have an incentive to change accounting figures through earnings management to avoid violating their obligations (Mangala, 2017).

Regulatory & Political Costs Motives

Industries related to the banking, insurance and utilities sectors are examined on a regulatory basis in terms of metrics and accounting ratios to confirm companies' compliance with industry and antitrust regulations. Banks that are in close proximity to minimum capital

requirements have incentives to use earnings enhancing management to avoid regulatory violations. Regulatory interventions, such as dividend restrictions and management termination, are imposed if the requirements are not met (Mangala, 2017).

1.3. Background of the research

The literature on earnings management includes many different areas of study and assesses the dependence of earnings management on various factors. In this analysis of the literature, I already refer specifically to the literature on relationship between earnings management and company debt. In general, there is quite a lot of literature, but there are contradictory results, which arouses interest in conducting own research to find out what the outcome will be for the market of our country.

In majority of studies authors try to show in-depth analysis of earnings management surrounding debenture issues of companies, also commonly used third variables that have a direct impact on the phenomenon in question. To measure earnings management as a proxy authors commonly used current discretionary accruals (McNichols, 2000). Many studies use additional variables that also have an impact on earnings management, because it is important to consider all valuable elements, as if to miss a variable, the results will be misleading, variables will be selected based on what the initial data analysis will show. After the initial data processing, it will be clear which variables carry the greatest weight for further investigation of Russian market.

In previous studies in this filed we can see that authors consider such additional variables as cash flow volatility (Ujah, 2014), institutional environments (An, 2016), firm size (Nalarreason, 2019), free cash flow and dividend policy (Padmini, 2020), audit quality (Orazalin, 2019), corporate governance (Ruwanti, 2019) etc.

Majority of the literature on earnings management demonstrated a positive relationship between higher level of debt and motive to manipulate earnings due to the existence of covenants in the firm's debt contracts. According to some investigations, investors would like to discover a positive earning, so due to that expectation arises that firms with higher leverage ratios have higher incentives to manage their earnings since they must present their lenders positive results so they will refinance firm debt (Burgstahler, 1997).

The study on the listed firms in Abu Dhabi Securities Exchange supports this idea and shows that the firms employ the phenomenon of earnings management, and the regression outputs of the empirical research show a significant positive effect of financial leverage on the acts of earnings management phenomenon. The primary objective of the study was to examine whether the capital structure of these firms affects the practices of earnings management and the test of the

hypotheses finds that the capital structure of listed firms in ADX affects the practices of earnings management phenomenon of the mentioned ones (Obeidat, 2016).

In the paper of Safa Lazzem and Faouzi Jilani (2018) they have investigated the role of leverage increases on the level of accrual-based earnings management in France. After an empirical analysis of the impact of leverage on earnings management, they have found that leverage has a positive effect on earnings management. Results of the study demonstrate a significantly positive interrelation between the absolute value of discretionary accruals and leverage. The results support the literature on debt covenants, which claimed that highly leveraged firms would have to meet investors' expectations, and they subsequently became engaged in earnings management practices. Therefore, indebtedness provides the basis for the emergence and enhancement of earnings management. In addition, they concluded that firms that experienced long-term debt growth over the sample period were more likely to manage their profits than highly leveraged firms (Lazzem, 2018).

The results of the research in Indonesian context also support the previously mentioned studies. It showed that leverage has a positive effect on earnings management. The results of the research come in line with agency theory and positive accounting theory on the debt contract hypothesis. Companies that have high leverage tend to do earnings management, which can be explained by the fact that companies tend to engage in earnings management when a company's condition is approaching a debt covenant default (Nalarreason, 2019).

Tahir's research focused on identifying the various factors related to earnings management that influence the capital structure of companies and to see the quantitative impact of these exogenous variables on the endogenous variable. In the course of operating activities, some costs are at the disposal of managers, which they can manipulate to change the profit and loss picture. Such costs clearly are discretionary accruals and should have some impact on the capital structure of firms. The quantitative impact of discretionary accruals assessed by the total effect model given in the study indicates that the capital structure is positively related to absolute discretionary accruals because the coefficient is positive. The statistical variable was found to be significant at the 1% level, indicating that it is impossible to accept the null hypothesis, which is ‘Discretionary Accruals have no relationship with firm’s gearing ratio’, and accept the alternative hypothesis. Thus, discretionary accruals had a significant modifying effect on the capital structure of the firms for which they were intended by managers (Tahir, 2011).

Gupta, M., Khurana, I. K., & Pereira, R. analyze indebtedness and short-term debt levels and also identify a positive relationship with earnings management in their cross-country analysis.

Most of the current studies support relation of the positive association between leverage and earnings management, however, there is also a different trajectory of scholarly thought on this issue. For instance, researchers often refer to control hypothesis, which indicates that firms with high levels of leverage are under a higher level of scrutiny and control by creditors and investors, which limits the manager's opportunistic discretion. This results in a reduction in the earnings management practice (Jensen, 1986).

Another study of the effect of leverage increase on accrual EM suggests that increased leverage is associated with reduced accrual EM. The results suggest that debt has a favorable consequence because increased debt reduces the manager's discretionary spending, and thus reduces accrual EM (Jelinek, 2007).

There are also a number of prior studies that have not found a relationship between capital structure and the phenomenon of earnings management. For instance, the findings of a study on listed firms in Nigeria showed that while firm size and corporate strategy have a significant positive effect on earnings management; the relationship between financial leverage and discretionary accruals of firms in the Nigeria sample, on the other hand, is not significant. This means that high-income companies do not engage in earnings management, seeking reports that will allow them to raise capital at reasonable rates. Therefore, the study concludes that auditors should pay close attention to firm size in the audit process because the larger the firm, the higher the level of earnings management (Uwuigbe, 2015).

From the preceding studies, it is clear that so far there is no single conclusion regarding this phenomenon. These different conclusions should be seen as a stimulus for both authors and scholars to study the earnings management phenomenon more deeply in different countries, especially in developing ones. The table below summarizes the outcome of the most relevant previous research on the relationship between the level of debt and the phenomenon of earnings management.

Table №1. Summary of prior researches conclusions

Author	Year	Positive Relationship	Negative Relationship	No Significant Relationship
Nalarreason, K. M., Sutrisno, T., & Mardiati, E.	2019	✓		
Lazzem, S., & Jilani, F.	2018	✓		
Obeidat, M. I. S.	2016	✓		
Uwuigbe, U., Uwuigbe, O. R., & Okorie, B.	2015			✓
Tahir S.H.	2011	✓		
Jelinek, K.	2007		✓	
Gupta, M., Khurana, I. K., & Pereira, R.	2008	✓		
Burgstahler, D. & Dichev, I.	1997	✓		
Jensen, M. C.	1986		✓	

1.4. Hypothesis development

Based on the studied literature, it is clear that there are no unambiguous results. Consideration of prior related studies helped to develop the main hypothesis. It is stated as follows:

H1: Level of debt has a positive impact on accrual-based earnings management.

There have also been some studies that have shown that there can be a difference between long-term and short-term debt relationship with earning management, so the distinction needs to be made. Short-term debt increases a firm's liquidity risk (and makes it less creditworthy) because it requires faster cash inflows to repay that debt. In addition, the negative effect of growth opportunities on leverage for firms with all short-term debt is less than one-sixth as an effect for

firms with all long-term debt (Johnson, 2003). Using this theory, a positive relationship between short-term debt and earnings management is expected.

The researchers found that the short-term debt ratio was positively related to discretionary accruals for firms with low creditworthiness, consistent with financial distress theory. They also found that this positive relationship is significantly weaker for investment-grade firms, consistent with the fact that lender monitoring reduces managers' opportunistic financial reporting behavior (Fung, 2013).

Gupta et al. (2008) report a positive short-term debt coefficient in their cross-country study on earnings management. According to Gupta et al. (2008) can be expected to suggest a positive relationship between short-term debt and earnings on an accrual basis for the average firm. Researchers examined whether short-term debt creates an incentive for borrowers to defer recognition of bad news through income management. Using a sample of data from 33 countries over a 10-year period, they found that short-term debt incentivizes greater earnings management. This impact of short-term debt is particularly strong in countries with weak legal regimes (Gupta, 2008).

Also, very important in the analysis of earnings manipulation in terms of debt maturity is the fact that firms face potential refinancing pressure, if we are talking about short-term debt, this occurs when debt matures and when managers believe that there may be obstacles or problems to obtain or renew debt after it matures. To increase the likelihood of extending a debt contract or obtaining new financing, firms have incentives to engage in earnings management to create an image of strong financial health. Evidence was presented that companies are more likely to have high discretionary accruals when their short-term debt increases, meaning that accruals can be managed in anticipation of debt refinancing. The researchers found that this relationship is strongest when new financing occurs in the presence of greater refinancing pressure (i.e., positive changes in short-term debt). They also found that the tendency for discretionary accruals to increase in response to refinancing pressures weakened in the presence of investment class, although this weakening for investment class firms disappears in the years following the global financial crisis (Fields, 2018).

On the other hand, the role of short-term debt monitoring has been accentuated by Datta et al. (2005). They argue that in the absence of alignment of goals between managers and shareholders, more self-interested managers favor long maturities of debt. Managers who select short-term debt expose themselves and their firms to more monitoring than those who select long-term debt. Datta et al. (2005) show that managers with more ownership in their firms use more short-term debt, which they find is in agreement with the fact that managers readily expose themselves and their firms to more monitoring. Firms that adopt short-term debt are more likely to be associated with

lower agency costs and, as a consequence, these firms are less likely to be involved in earnings management. Managers with weak alignment with shareholder interests and an inherent attachment to greater autonomy would thus prefer to entrench themselves by opting for long-term debt in order to reduce the potential discipline of external monitoring. The author argues that with weak alignment of manager and shareholder interests, managers would be more likely to choose a suboptimal debt repayment structure. In particular, in such a scenario, they would prefer long-term debt over short-term debt, even though the associated agency costs of taking such action are higher (Datta, 2005).

Since the studies make this distinction, I find it reasonable to separate out the effect of the level of short-term debt and long-term debt on the earnings management, hence the following two hypotheses in their null form:

H2: Level of short-term debt has a positive impact on accrual-based earnings management.

H3: Level of long-term debe has a positive impact on accrual-based earnings management.

1.5. Earning management measure

Many studies have used different accrual-based forecasting models for different purposes. Usually, these models are used to determine earnings management. Earnings are assumed to have been managed in a projected way in response to certain incentives (Watts, 1990), and discretionary accruals used to manage earnings are estimated from these accrual-based prediction models. Typically, realized accruals are compared to forecasts from an accrual-based forecasting model, and expected forecast errors represent discretionary accruals, or earnings management. In essence, projected accruals are assumed to represent nondiscretionary accruals that would be observed in the absence of any earnings management incentives (Thomas, 2000).

A common baseline for measuring discretionary accruals is total accruals. A specific model is then adopted for the process generating the non-discretionary component of total accruals, allowing the total accruals to be decomposed into discretionary and non-discretionary components. Most models would require the estimation of at least one parameter, and this is usually done using an "estimation period" during which no systematic earnings management is predicted. This paper discusses three models that help compute generating nondiscretionary accruals (Dechow P. M., 1995). These models are general representations of models that have been used in the existing

earnings management literature. These models are considered in the paper to compare the outcomes of the main model based on the results obtained.

Jones model (1991)

The most common and one of the basic models that are now used to identify discretionary accruals is the Jones model. It allows us to assess the implementation of earnings manipulation by company management. The Jones model estimates earnings management on the basis of accruals. Accruals are the difference between net income and a company's operating cash flow.

The company's total accruals in a certain reporting period consist of normal and abnormal (discretionary) accruals. Normal accruals are a consequence of the company's operational activity and are unavoidable. Abnormal accruals theoretically should not be present, and for this reason they are interpreted as a measure of earnings management. If abnormal accruals are positive, then the company may be overstating profits in a given accounting period; if they are negative, then profits are probably being understated.

The Jones model reflects the relationship between a company's accruals and the main indicators of its operating performance. The Jones regression model is used for evaluation, reflecting the dependence of this company's index on three factors:

$$Total\ Accruals\ /\ TA_{t-1} = \alpha_1\,(1/TA_{t-1}) + \alpha_2\,(\Delta REV_t/TA_{t-1}) + \alpha_3\,(PPE_t/TA_{t-1}) + \varepsilon_t \quad (1)$$

where ***Total Accruals*** are calculated using the following formula:

$$TA_t = \Delta CA_t - \Delta CL_t - \Delta Cash_t \quad (1.1)$$

TA_t = Total accruals in year t,

ΔCA_t = Change in current assets in year t,

$\Delta Cash$ = Change in cash and cash equivalents in year t,

ΔCL_t = Change in current liabilities in year t,

ΔREV_t = Revenues in year t less revenues in year $t-1$,

PPE_t = Gross property plant and equipment in year t,

α_1, α_2, and α_3 = Parameters to be estimated, namely alphas,

ε_t = Residuals in year t.

Modified Jones model (1995)

In the empirical part of the paper, I use a modified version of the Jones Model as my main model, as it is considered to be one of the most reliable and most commonly used. The modification is supposed to eliminate the assumed tendency of the Jones model to measure discretionary accruals with error in the exercise of discretionary power over revenues. The modified version of the Jones Model measures discretionary accruals over an event period.

The only adjustment from the original Jones Model is that the change in revenue is adjusted for the change in receivable in the event period. The original Jones Model implicitly assumes that discretion over revenue is not exercised in either the estimated or event period. The modified version of the Jones Model implicitly assumes that all changes in loan sales in the event period are the result of revenue management. This is based on the assumption that it is easier to manage earnings using discretion in reflecting sales on credit than it is to manage earnings using discretion in reflecting sales on cash. If this modification proves successful, then in those samples where earnings management was done through earnings management, the earnings management estimate should no longer be biased to zero (Dechow P. M., 1995).

To calculate the total accruals for the model fallowing calculation takes place:

$$TACC_t = \Delta CA_t - \Delta Cash - \Delta CL_t + \Delta DCL_t - DEP_t \quad (2.1)$$

$TACC_t$ = Total accruals in year t,

ΔCA_t = Change in current assets in year t,

$\Delta Cash$ = Change in cash and cash equivalents in year t,

ΔCL_t = Change in current liabilities in year t,

ΔDCL_t = Change in short term debt included in current liabilities in year t,

DEP_t = Depreciation and amortization expense in year t.

Then estimation of the Modified Jones Model fallows, which is defined as:

$$\frac{TACC_t}{A_{t-1}} = \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 \frac{(\Delta REV_t - \Delta REC_t)}{A_{t-1}} + \alpha_3 \frac{PPE_t}{A_{t-1}} + \varepsilon_t (2.2)$$

$TACC_t$ = Total accruals in year t divided by total assets in year $t-1$,

ΔREV_t = Revenues in year t less revenues in year $t-1$,

ΔREC_t = Net receivables in year t less net receivables in year $t-1$,

PPE_t = Gross property plant and equipment in year t,

$A_{t-1.}$ = Total assets in year $t-1$,

α_1, α_2, and α_3 = Parameters to be estimated, namely alphas,

ε_t = Residuals in year t.

Further calculate the discretionary accruals. The discretionary accruals will be calculated with the next formula:

$$DACC_t = TACC_t - NDACC_t \quad (2.3)$$

The non-discretionary accruals can be calculated with the next formula:

$$\frac{NDACC_t}{A_{t-1}} = \hat{\alpha}_1 \frac{1}{A_{t-1}} + \hat{\alpha}_2 \frac{(\Delta REV_t - \Delta REC_t)}{A_{t-1}} + \hat{\alpha}_3 \frac{PPE_t}{A_{t-1}} \quad (2.4)$$

$NDACC_t$ = Non-discretionary accruals divided by total assets in year $t-1$,

$\Delta REV_{t.}$ = Revenues in year t less revenues in year $t-1$,

ΔREC_t = Net receivables in year t less net receivables in year $t-1$,

PPE_t = Gross property plant and equipment in year t,

A_{t-1} = Total assets in year $t-1$,

α_1, α_2, and $\alpha_{3.}$ Estimated parameters, namely alphas.

Kang-Sivaramakrishnan (KS) model (1995)

Kang and Sivaramakrishnan propose a different approach to determining discretionary accruals than the two previously outlined models discussed earlier. They project the level of current assets and liabilities rather than changes in these accounts, and estimate one set of model parameters for all firms rather than estimating firm-specific parameters. Firm-specific estimation is difficult because of the data requirements. Their model mitigates the problem of omitted variables by including additional variables (cost of goods sold and other operating costs), and mitigates problems of simultaneity and error in variables by using instrumental variables and generalized method of moments procedures.

$$\frac{\mathrm{ACCBAL}_t}{TA_{t-1}} = \alpha_0 + \alpha_1 \frac{REV_t}{TA_{t-1}}\left(\frac{ART_{t-1}}{REV_{t-1}}\right) + \alpha_2 \frac{EXP_t}{TA_{t-1}}\left(\frac{OCAL_{t-1}}{EXP_{t-1}}\right) + \alpha_3 \frac{GPPE_t}{TA_{t-1}}\left(\frac{DEP_{t-1}}{GPPE_{t-1}}\right) \quad (3)$$

Where,

ACCBAL = non-cash current assets and liabilities (excluding tax receivables and payables) less depreciation,

ART = accounts receivable less tax receivables,

EXP = expenses (sales- operating income before depreciation),

DEP = depreciation from income statement,

OCAL = other current assets and liabilities (current assets – ART – cash - income tax refund - (current liabilities - income taxes payable)),

GPPE - gross plant, property and equipment,

TA = total assets,

REV = revenue,

PPE = plant, property and equipment.

According to the authors, the model that uses the Generalized Method of Moments (GMM) shows the best results, although it is more computationally intensive. The authors also argue that one should expect the differences in the statistical power of these approaches in detecting earnings management to decrease as the degree of earnings management increases (Kang, 1995). In general, this model is considered additional, the main calculations will be performed by the modified Jones model.

1.6 Summary

Earnings management can be loosely defined as a strategy for generating accounting profits, which is carried out on the basis of management's discretionary authority to choose accounting methods and cash flows from operating activities. Earnings management is defined as the manipulation of earnings using the discretion allowable by accounting standards and restructuring the transaction so that the value of the firm is not negatively impacted.

According to Deepa Mangala and Isha (2017) motives for earnings management can be grouped into four main categories as follows:

- capital market drivers;
- management compensation contract drivers;
- external contracts drivers;
- regulatory & political costs drivers.

Based on previous studies, it is reasonable to expect that the relationship between the level of debt and earnings manipulation should be positive and significant, but there are studies that have found the opposite results, so we should not expect unambiguity on this issue. Moreover, it should be taken into account that there are not many studies conducted in developing markets.

The study further derives three hypotheses, as the results of previous studies mention differences in the regulation of long-term and short-term debt, so it makes sense to test the relationship between debt maturity and earnings management. Since short-term and long-term debt have a different level of monitoring by creditors and different pressure while refinancing is needed.

As a proxy for earnings management most commonly used discretionary accruals. They are estimated from accrual-based prediction models. Modified Jones Model is considered as the most reliable and it is most commonly used by scholars. Previous research has confirmed that the modified Jones model is effective for identifying earnings management mainly in developed and developing economies. However, it may not be very reliable for underdeveloped countries (Islam, 2011). Russia belongs to developing countries, so it is appropriate to use this model to identify this phenomenon. Moreover, to calculate earnings management, in some models used data that are not published for Russian companies, so not all models are available for analysis of the local market. Therefore, modified Jones model is the model that will be primary in the calculation of discretionary accruals and will be taken as the baseline.

CHAPTER 2. EMPIRICAL STUDY OF THE RALATIONSHIP BETWEEN THE LEVEL OF DEBT AND EARNINGS MANAGEMENT OF RUSSIAN COMPANIES

2.1. Research Methodology

Further in the paper presented empirical part of the research. It is meant to be explanatory type of research as it identifies cause and effect relationships between the factors of interest. The chapter describes the sources and methods of data collection, as well as their descriptive statistics. The research methodology will also be described below, together with an analysis of the basic research model.

2.1.1. Data collection

This research investigates the relationship between earning management and the level of debt in Russian companies. Therefore, the data were collected specifically for Russian publicly traded companies that provide annual IFRS statements. Thus, the data include companies that are on the first, second and third levels of listing on the Moscow Stock Exchange, excluding financial intermediaries. Since earnings management among financial intermediaries is a separate field of investigation, as characteristics of this industry differ and cannot be analyzed in line with others. Also, some third level companies were excluded due to insufficient data for analysis.

The data necessary for calculating EM proxy – discretionary accruals as well data for the basic model calculation were collected primarily from the SPARK database. However, in some cases there was a need to supplement it manually, if the data from the database were insufficient for the calculations. Data collected manually was obtained from corporate websites and published annual reports of the companies.

The resulting sample consists of 173 companies. The analyzed time period is nine years, specifically 2011-2019. Data have been collected since 2011, so that the impact of the economic crisis of 2008-2009 was not included in the analysis and did not affect the results of the study. In the following analysis, therefore, 1,557 firm-years observations are considered. List of companies is presented in the Appendix 1.

2.1.2. Data description

The final dataset includes 15 industries. Industries among dataset are not equally distributes due to the heterogeneity of the Russian market, as well as the representation of companies on the Moscow Stock Exchange. The expected outcomes for the companies with the lowest

representation are small, but they are also included in the analysis for the overall relationship picture results.

The table below describes the distribution of companies according to the industry. The most widely represented industries in the dataset under investigation are Production of industrial goods and services and Production and distribution of electricity, gas and water. There are 39 companies from Production of industrial goods and services, which is 23% of the sample and 35 companies from Production and distribution of electricity, gas and water (20%). The third industry is Extraction and production of basic resources, it includes 25 companies and results 14% of the sample. Chemical industry represents 11% of the data and includes 19 companies, while Mining of oil and gas occupies 8% and consists of 14 companies. Telecommunication takes 5% and represented with 9 companies.

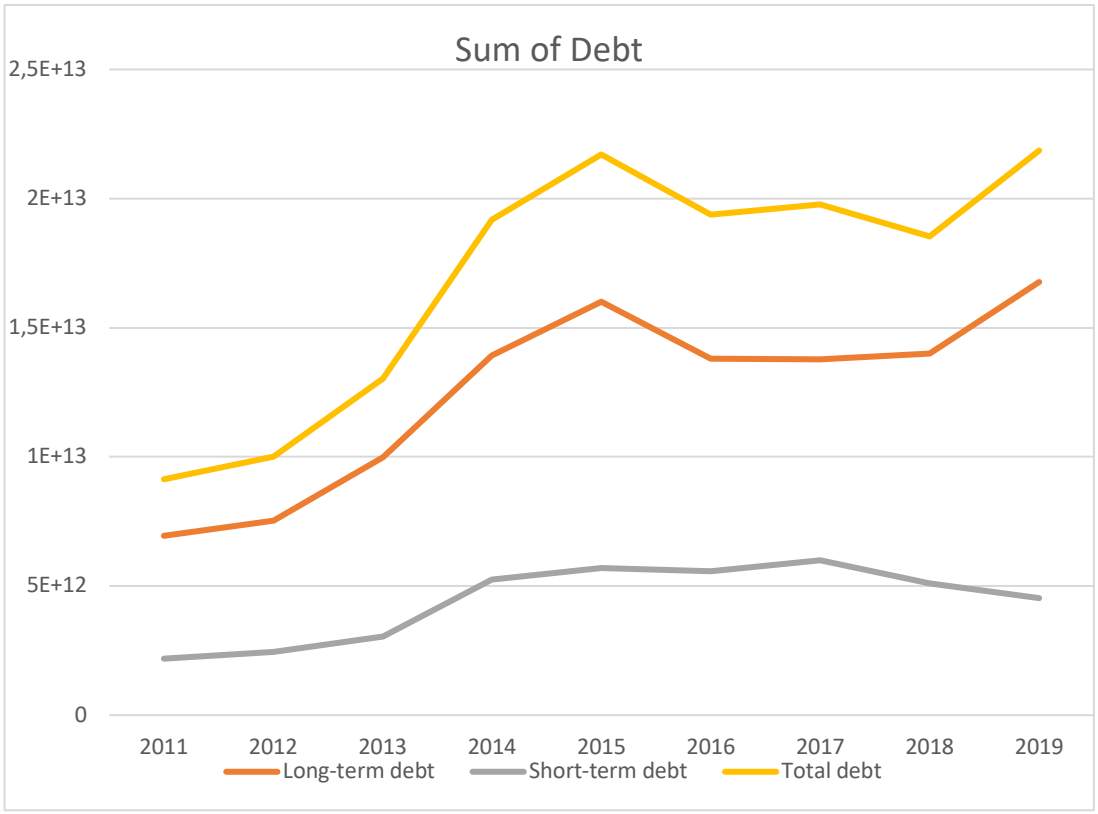
Other industries are less represented in the dataset. So, there are Retail industry, Food and beverage industry, Production of cars and spare parts, Construction and production of building materials each for 3%; Media goods and services and Goods and services for health care each 2%. Tourism includes 2 companies and is slightly more that 1%. Real estate and Production of personal and household goods only represented in one company and take less then 1% of the dataset.

Table №2 Distribution by industry

Industry	**Number of companies**	**%**
Production of industrial goods and services	39	23%
Production and distribution of electricity, gas and water	35	20%
Extraction and production of basic resources	25	14%
Chemical industry	19	11%
Mining of oil and gas	13	8%
Telecommunication	9	5%
Retail industry	6	3%
Food and beverage industry	6	3%
Production of cars and spare parts	6	3%
Construction and production of building materials	5	3%
Media goods and services	3	2%
Goods and services for health care	3	2%
Others	4	2%
Total	***173***	***100%***

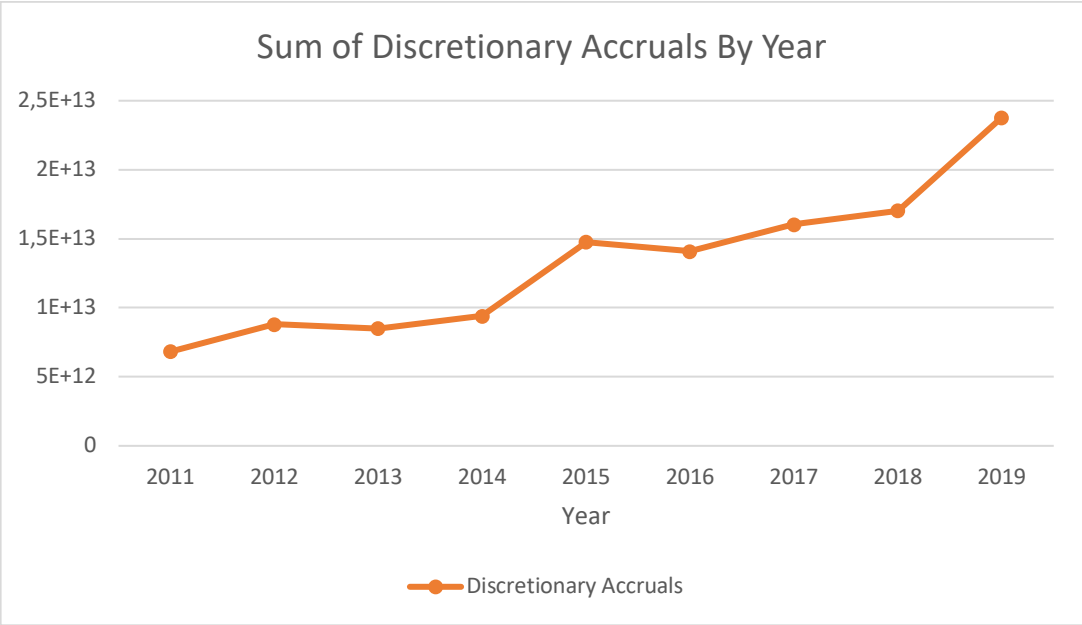
In the following graph represented the distribution of the amount of short-term debt, long-term debt and total debt by sum. We can observe that the values of short-term debt do not have great fluctuations and increases very gradually, while the level of long-term debt and accordingly total debt has more fluctuations and shows a significant increase over the studied period of time. Bigger rise can be observed after 2014, when sanctions towards Russian companies were introduced. Economic crisis could play a significant negative role for companies, fall in earnings could have led to the need to ingratiate funding through debt.

Figure 1. Sum of debt By Year



Discretionary accruals do not show such significant fluctuations. However, these fluctuations occur in some observable consistency with long-term debt and total debt. Rise in discretionary accruals also can be observed after 2014. As it is used as a proxy for earnings management, we can assume that level of earnings management is increasing. Presumably to meet the expectations of creditors and obtain further financing.

Figure 2. Sum of Discretionary Accruals By Year



Since 2014, the U.S., the EU and a number of other Western countries have been pursuing a policy of sanctions against Russia, which implies a set of financial, trade and economic, visa and other restrictions imposed on certain industries and sectors of the national economy, against certain individuals and companies in Russia, as well as their partners and counterparties abroad.

It should be noted that these sanctions are targeted at the key budget-forming sectors of the real sector of the Russian economy. These sanctions currently apply to oil and gas companies and their subsidiaries in the form of restrictions on the export of oil production and refining technologies to Russia, the freezing of existing projects and the rejection of new ones. In addition, the functioning of these industries is also adversely affected by sanctions against the banking industry, associated with the freezing of financial assets of Russian legal entities and individuals, limiting access to credit resources, etc. Vulnerability of the national economy to economic sanctions is caused by "weaknesses" of the national economy concerning the need for cheap loans and investments, dependence on the global financial system, the main institutions of which are concentrated in the EU and the USA, and dependence on supplies of high-tech equipment, particularly in the mining and mineral processing sector.

Below presented the table with the T-test results, we are looking how the average level of debt and discretionary accruals have changed after the sanctions were introduced. Factor 0 stands for the time period before 2014, and 1 – for after. We can see that according to the T-test average level of discretionary accruals and the leverage was lower before the crisis. And accordingly, the level of discretionary accruals and leverage is higher after the 2014 as well as standard deviation has increased.

Table№3 T-test results for discretionary accruals

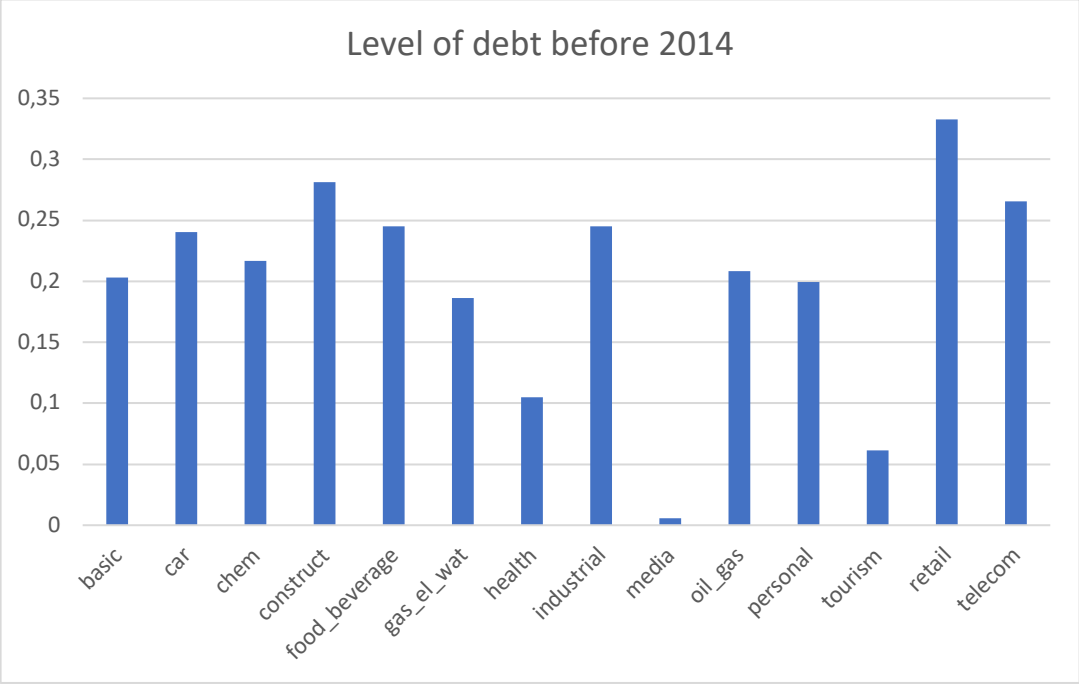
Factor	Count	Mean	St.Dev
0	519	0,203	0,198
1	1038	0,296	0,256

Table№4 T-test results for total debt

Factor	Count	Mean	St.Dev
0	519	0,216	0,190
1	1038	0,243	0,235

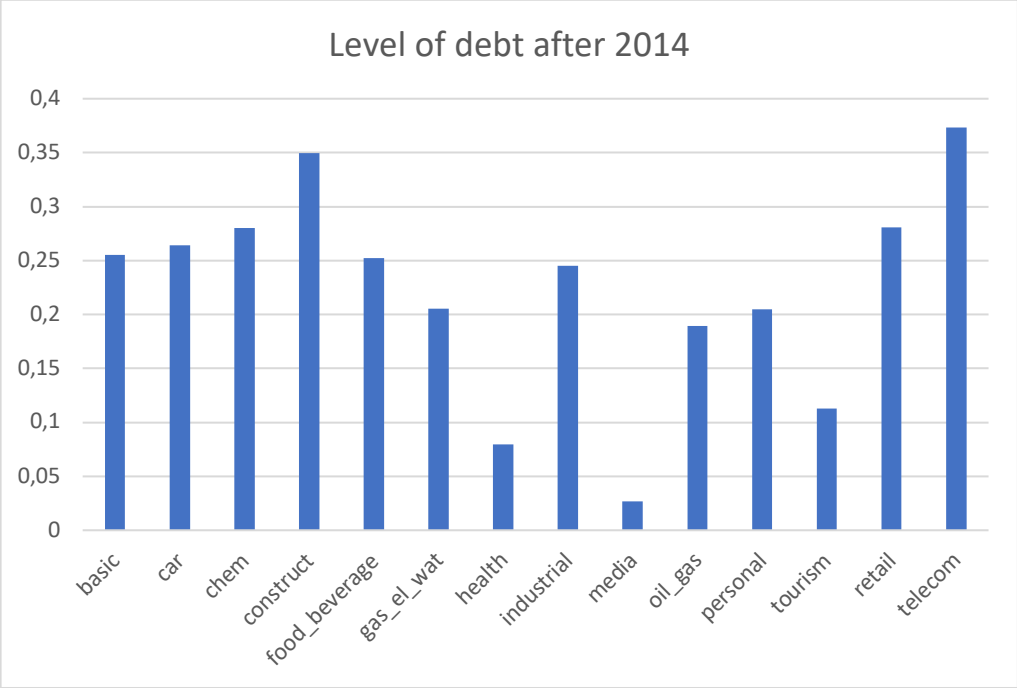
This leads us to the conclusion that the sanctions have unambiguously affected the economic condition of Russian companies, as on average both the level of debt and the discretionary accruals have increased since the beginning of this crisis. We can look specifically which industries were most affected after the above changes.

Figure 3. Level of Debt before 2014



Based on the graphs, we can see that the highest level of debt is observed in Retail industry. Then come such industries as Construction and production of building materials and Telecommunication. The lowest level of debt is found in the Media goods and services industry, but this industry is poorly represented in our dataset.

Figure 4. Level of Debt after 2014



After the imposition of sanctions in 2014, we can see that almost all industries have increased their debt levels, but Mining of oil and gas and Retail industry have decreased their debt levels. This is due to the fact that it was the oil and gas industry that relied to a fairly large extent on foreign creditors and investors. And it is precisely this industry that has found itself under sanctions to a greater extent. Also, a large number of foreign products stopped supplying to Russia and severed economic ties with the country, which also worsened the economic situation of the industry and reduced the number of creditors during the crisis.

2.1.3. Empirical model and variables

In this paper, the data are analyzed using multiple regression analysis. Regression will be used to identify the relationship between the independent variables of the underlying model and earnings management. To test the hypothesis on the nature of the relationship between level of debt and absolute value of discretionary accruals as a proxy for earnings management, estimation of panel-regression models is needed, where total debt, short-term debt and long-term debt interchanged to see the difference among dependance of earnings management on them.

The following empirical models are used to conduct the multiple regression analysis:

1. $|DAC_{i,t}| = \beta_0 + \beta_1 TD_{i,t} + \beta_2 ROA_{i,t} + \beta_3 GROWTH_{i,t} + \beta_4 INTEXP_{i,t} + \beta_5 SIZE_{i,t} + \mu_{i,t}$
2. $|DAC_{i,t}| = \beta_0 + \beta_1 STD_{i,t} + \beta_2 ROA_{i,t} + \beta_3 GROWTH_{i,t} + \beta_4 INTEXP_{i,t} + \beta_5 SIZE_{i,t} + \mu_{i,t}$
3. $|DAC_{i,t}| = \beta_0 + \beta_1 LTD_{i,t} + \beta_2 ROA_{i,t} + \beta_3 GROWTH_{i,t} + \beta_4 INTEXP_{i,t} + \beta_5 SIZE_{i,t} + \mu_{i,t}$

Where,

μ : The error term

i : indicate firm

t : presents the year of analysis

β_0 : regression constant.

β_1, β_2, β_3, β_4, β_5, β_6 and β_7: coefficients of corresponding variables to represent the effects on earnings management.

DAC stands for absolute value of discretionary accruals. Discretionary accruals is a proxy for accrual based earnings management. TD stands for the ratio of total debt to total assets. STD is the measure of the use of short-term debt and calculated as debt in current liabilities divided by total assets. LTD is long-term debt divided by total assets. ROA stands for return on assets. GROWTH is the ratio of revenue year-end minus revenue previous year and revenue previous year. INTEXP is the ratio of interest expense to total debt. SIZE is a proxy for firm size, it is calculated by the natural logarithm of total assets at year-end.

Dependent variable

Earnings consist of two components: cash flow from operations and total accruals. Total accruals represent management's judgment and estimates of cash flow in order for accounting earnings to better reflect the underlying economic performance of the company. Total accrual is the sum of discretionary and non-discretionary accruals. The accrual component, which is imposed by the accounting regulator in adjusting a firm's cash flows, is the non-discretionary accrual. The accrual component, which is imposed by the accounting regulator in adjusting a firm's cash flows, is the discretionary accrual method. According to Dechow (1994), discretionary accruals often provide managers with the ability to manipulate earnings because of the flexibility they have.

Discretionary accruals are widely used as a proxy for earnings management. They are calculated by identifying the non-discretionary accruals as part of the total accruals. Most commonly used and reliable models were previously discussed. The modified Jones model was used as the basis for this study. Resulting numbers on the model will be discussed further in the analysis. According to

our estimations of discretionary accruals, we can observe up to 73% of the real state of matters and describes a fairly significant number of them. As estimated model showed R^2 at the level of 0,7339 and Adjusted R^2 at the level at 0,7335. Model estimation is presented in the Appendix 2.

Independent variables

The main variables of interest are total debt, short-term debt and long-term debt. Level of total debt might be associated with earnings management, as some managers have an incentive to manage earnings upwards to facilitate the limitations associated with accounting-based debt contracts. On the other hand, some researches indicated that earnings can be managed downward to simplify debt renegotiation in case of financial difficulties. According to majority of studies level of total debt (TD) is expected to have positive coefficient.

Short-term debt (STD) according to the research of Gupta M., etc. (2008) should be positively associated with earnings management in countries with weak legal enforcement. Also, with short-term debt, companies need additional financing and they need to ask for it or have to negotiate with banks and get extensions and it makes them show more positive reporting and hence there can be motivation in earnings management, so the coefficient is expected to be positive.

Firms that adopt long-term debt (LTD) are more likely to be associated with higher agency costs and, as a consequence, these firms are more likely to be involved in earnings management. With accordance to this the coefficient is expected to be positive.

According to Jensen (1986) higher interest expense is able to control opportunistic behavior. Hence, this study also controls for INTEXP. A high interest rate can result in a dubious ability of the firm to pay its financial expenses, which decreases its chance to contract new debts. In fact, it is suggested that leverage increases may lead to an increase in interest payments which in turn results a decrease in net income.

Return on assets (ROA) is used to measure performance. Prior research suggests that ROA controls for the effect of performance on measured discretionary accruals (Kothari, 2005). It is expected that firms with a strong ROA are less likely to take part in accrual earnings management. Kothari et al. (2005) found a negative relationship between ROA and earnings management. This result indicates that managers of poor performers firms are more motivated to engage in earnings management activities.

According to previous studies sales growth (GROWTH) should not be in significant relationship with the earnings management. It is expected that high growth firms have a strong financial position and they don't need to manipulate earnings, as they are in a better position in dealing with auditors and they attract more investors due to their high growth potential (Asim, 2019).

The size is one of the most significant attributes of a firm. Compared to small firms, large firms have more of the advantages of economies of scale and economies of scope. They are more likely to be mature and operate in a stable state. They also tend to be more diversified, with operating fluctuations in different business sectors mutually offsetting each other. All of this means that large companies have lower overall operating volatility and, therefore, lower accrual variability. In addition, political process theory suggests that large firms are more sensitive to politics and incur higher political costs once they are found to have managed earnings (Watts, 1990). SIZE affects discretionary accruals, so it is also included in the model is a log of total assets to control for the possible impact of size on earnings management. Large firms may have less incentive to participate in earnings management because they are subject to increased external control. However, there are mixed arguments on the direction of its association. On one hand, there may be a negative association between size and discretionary accruals. On the other hand, some studies claim that the larger the firm size, the more likely it will choose income decreasing accounting accruals to avoid political costs.

Below presented the table which summarizes mentioned variables:

Table№5 Summary of variable definitions

Variable	*Description*
Dependent	
DACC	Discretionary accruals as a measure of accrual-based earnings management, calculated by Modified Jones Model
Independent	
TD	Total debt is measured based on the ratio of total debt to total assets.
STD	Short-term debt maturity as debt in current liabilities divided by total assets.
LTD	Long-term debt maturity as debt in non-current liabilities divided by total assets.
ROA	Discretionary accruals may result from past or current performance. Thus, return on assets are used to control the impact of current performance on the creation of discretionary accruals. ROA = $Net\ income/\ Total\ assets$.
GROWTH	It is calculated by the ratio of revenue year-end minus revenue previous year and revenue previous year. Multiply the result by 100 to get the percent sales growth.
INTEXP	Measure to control the effect of interest expense. This measure is calculated as the ratio of interest expense to total debt.
SIZE	SIZE is a proxy for firm size, it is calculated by the natural logarithm of total assets at year-end.

2.2. Results

2.2.1. Descriptive statistics

Descriptive analysis shows the minimum, mean, maximum, and standard deviation values of the variables. Results from descriptive statistics (Table№ 6) provide mean discretionary accruals (DACC) of about -0,0998 with standard deviation of 0,2994. The value of standard deviation is large for size, that is, 2,1573. It is the largest as other variables show relative values. Whereas, interest expense (INTEXP) has the lowest value of 0.0242 as compared to other variables. The results imply that on average selected firms are engaged in downward earning management activities. The maximum value of DACC (4,5327) indicates positive abnormal accruals among sample firms that may suggest that accruals are being managed upward to avoid earning loss. However, the minimum negative value (-3,3546) suggests that accruals are managed downwards to avoid earning increases. As the mean of DACC is negative value, we can assume that mostly firms engage in downwards manipulation. Mean values of ROA and growth are 0,0254 and 0,0399, respectively with standard deviations of 0,1877 and 0,6242, respectively.

Table №6 Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
|DACC|	1557	0,4312	0,2387	0.0001	4,5327
DACC	1557	-0,0998	0,2994	-3,3546	4,5327
TD	1557	0.2321	0,2214	0.0000	2.0701
STD	1557	0.3579	0,2126	0.0000	0.5023
LTD	1557	0.6420	0,2631	0.0000	0.9283
ROA	1557	0,0254	0,1877	-2,6471	2,0142
GROWTH	1557	0,0399	0,6242	-1,000	4,0138
INTEXP	1557	-0.0103	0.0242	-0.1726	1.4367
SIZE	1557	24.6073	2,1573	16.3412	30.7167

2.2.2. Regression results

Based on the Hausman test, it was identified that the best model to estimate regressions would be a Random Effects Model, as the p-values are above 0.05. This will give us more consistent estimates. Other tests were implemented as well. Results on the models justification are in the Appendix 4.

The equestion for the first model is presented below:

$$1.|DAC| = 0{,}28 + 0{,}08TD - 0{,}05ROA - 0{,}0001GROWTH - 0{,}013INTEXP - 0{,}007SIZE + \mu$$

Defining a regression equation that summarizes the overall result of the study is useful to understand the relationship between earnings management and the independent variables, namely total debt, ROA, firm size, interest expense and sales growth. The coefficients for each variable show the level of change that can be expected in earnings management when the value of any particular variable is increased/decreased by one unit, assuming that all other variables tested in the model remain constant.

Table №7. Model 1 Estimates: Regression Results (Total debt)

DACC	**Coefficient**	**Std. Error**	**t-value**	**Pr(>| t |)**	**VIF**
Intercept	0.2799	0.0573	4.8791	1.066e-06 ***	
TD	0.0767	0.0136	5.6219	1.888e-08 ***	1.143099
ROA	-0.0468	0.0209	-2.2377	0.025240 *	1.141179
SIZE	-0.0070	0.0022	-3.0712	0.002 **	1.035002
INTEXP	-0.0131	0.0611	-0.215	0.82978	1.016432
GROWTH	-0.0001	0.0002	-0.4749	0.6348	1.011580
Multiple R^2	0.3581				
Adjusted R^2	0.3311				
p-value	5.9884e-13				
Durbin-Watson:	1.5335				

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

The regression model seems to be significant as we can see low p-value. Multiple R-square of the model is 0.3581 and adjusted R-square equals to 0.3311 meaning that approximately 33 % of the Earnings Management variability is explained by the independent variables selected. It is not very high, but it corresponds to the previous results. The result of Durbin-Watson statistical test is presented as well. This test statistic is employed to determine if there is autocorrelation in the residuals of the regression results. Small values of Durbin-Watson statistics can signal that there is the presence of autocorrelations. The value generally falls somewhere within the range of 0 and 4, for the current model the value comprises 1.5335, which is close to the mid-point 2 and thus proves the assumption that there is no autocorrelation between the residual errors. To measure multicollinearity variance inflation factor (VIF) was used, which assesses how much the variance of an estimated regression coefficient increases if predictors are correlated. If no factors are correlated, the VIFs will all be 1. In our case all VIFs are close enough to 1, so we can conclude that there is no multicollinearity present.

Results obtained after testing the first hypothesis show that the total debt has a significant positive impact on accrual earnings management activities which means that when the debt increases, then managers are more involved in AEM. The significance of the variable is at the level of 1%. Therefore, one unit increase in total debt would result in 0.0767 increase in Earnings Management. When the firms have a high debt level, they face the pressure of debt covenant cost and the managers adopt accounting policies to manipulate earnings in order to report a favorable financial statement. So, they are also involved in increasing AEM to report favorable earnings in order to attract the investors. The results are also consistent with previous studies (Nalarreason, 2019; Lazzem, 2018; Obeidat, 2016; Tahir, 2011; Gupta, 2008).

The equestion for the second model is presented below:

2. $|DAC| = 0{,}33 + 0{,}03STD - 0{,}09ROA - 0{,}0001GROWTH - 0{,}036INTEXP - 0{,}007SIZE + \mu$

Table №8 Model 2 Estimates: Regression Results (Short-term debt)

DACC	Coefficient	Std. Error	t-value	Pr(>| t |)	VIF
Intercept	0.3277	0.0590	5.5537	2.797e-08 ***	
STD	0.0325	0.0163	1.9923	0.046333 *	1.002254
ROA	-0.0877	0.0201	-4.3582	1.312e-05 ***	1.016140
SIZE	-0.0074	0.0023	-3.1242	0.001783 **	1.032036
INTEXP	-0.0360	0.0647	-0.5574	0.577243	1.007382
GROWTH	-0.0001	0.0002	-0.4922	0.622566	1.011928
Multiple R^2	0.3232				
Adjusted R^2	0.3204				
p-value	4.3733e-07				
Durbin-Watson:	1.5625				

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

The second regression model is significant enough for this type of research as well, as we can observe small p-value. Multiple R-square of the model is 0.3232 and adjusted R-square equals to 0.3204 meaning that approximately 32 % of the Earnings Management variability is explained by the independent variables in the model. The result of Durbin-Watson statistical test falls somewhere within the range of 0 and 4, for the second model the value comprises 1.5625, which is close to the mid-point 2 and thus also proves the assumption that there is no autocorrelation between the residual errors. All VIFs are close enough to 1, so there is no multicollinearity present.

Results obtained after testing the second hypothesis show that short term debt also has a significant impact on accrual earnings management activities which means that we can accept the second hypothesis. This is consistent with the conclusion that firms face potential refinancing pressure more, this appears when debt matures and when managers believe there may be obstacles or problems in obtaining or renewing debt after maturity. To increase the likelihood of extending a debt contract or obtaining new financing, firms have incentives to engage in earnings management to create an image of strong financial health.

The equestion for the third model is presented below:

3. $|DAC| = 0{,}34 + 0{,}008LTD - 0{,}09ROA - 0{,}0001GROWTH - 0{,}038INTEXP - 0{,}008SIZE + \mu$

Table №9 Model 3 Estimates: Regression Results (Long-term debt)

DACC	Coefficient	Std. Error	t-value	Pr(>| t |)	VIF
Intercept	0.3413	0.0584	5.8431	5.124e-09 ***	
LTD	0.0075	0.0184	0.4111	0.6809	1.004472
ROA	-0.0894	0.0201	-4.433	9.293e-06 ***	1.016002
SIZE	-0.0076	0.0023	-3.1968	0.00139 **	1.034335
INTEXP	-0.0380	0.0648	-0.5877	0.55673	1.007271
GROWTH	-0.0001	0.0002	-0.5279	0.59759	1.011629
Multiple R^2	0.3212				
Adjusted R^2	0.3183				
p-value	< 2.493e-06				
Durbin-Watson:	1.5589				

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

The third model is also significant, as small p-value is presented. Multiple R-square of the model is 0.3212 and adjusted R-square equals to 0.3183 meaning that approximately 32% of the Earnings Management variability is explained by the independent variables in the model. The result of Durbin-Watson statistical test for the third model the value comprises 1.5589, which is close to the mid-point 2 and thus also proves the assumption that there is no autocorrelation between the residual errors. VIFs are close to 1, so there is no multicollinearity present.

Results obtained after testing hypothesis number three show that level of long-term debt has no significant positive impact on accrual earnings management activities. This means that we cannot accept nor reject the third hypothesis. The variable is not significant at all. This goes in an alignment with conclusions that if a company uses more long-term debt, it is less dependent on banks since there is no need for regular refinancing, hence less need to resort to managing earnings and showing putative positive figures.

Table №10 Research results

Hypothesis	Research results	
H1	Total debt (TD) has significant positive relationship with accrual earnings management.	*Accepted*
H2	Short-term debt (STD) has no significant positive relationship with accrual earnings management.	*Accepted*
H3	Long-term debt (LTD) has significant positive relationship with accrual earnings management.	*Cannot be accepted, nor rejected*

Summary of results on other variables

All models have identical set of independent variables, the difference is that the variables of total debt, long-term debt and short-term debt have been interchanged. Three models have shown that ROA is significantly related to discretionary accruals. The relation to discretionary accruals is negative, which means that firms with a strong ROA are less likely to use discretionary accruals to manage earnings.

The SIZE is significant for all models at the level of 1%. And as it was expected the value is negative, which means that larger firms have less incentive to take part in earnings management. It can be explained as they are under greater attentions and monitoring from external control. In previous studies, the authors found that variability decreases as firm size increases, consistent with the fact that larger firms have less operational volatility and are less likely to manage earnings because of higher political costs than smaller firms (Gu, 2005).

Regarding the variable value of interest expense (INTEXP), the results show that the cost of debt does not have a significant effect on earnings management. These results show that interest expense has no effect on the earnings management practices of the companies under investigation.

GROWTH was not considered significant enough to have any relationship with AEM. This may be because firms that are in growth have a strong financial position and are better positioned to work with auditors. Growing firms also attract investors and have more credibility with lenders, which results in them not having to manipulate earnings to either side.

Specification of the model with dummy variable for sanctions

Table №11 Model 1 Estimates: Regression Results (Sanctions)

DACC	Coefficient	Std. Error	t-value	Pr(>| t |)
Intercept	0.2773	0.0574	4.8279	1.380e-06 ***
TD	0.0778	0.0136	5.6858	1.302e-08 ***
ROA	-0.0469	0.0209	-2.2424	0.024935 *
SIZE	-0.0067	0.0023	-2.9288	0.003403 **
INTEXP	-0.0242	0.0620	-0.3901	0.696426
GROWTH	-0.0001	0.0002	-0.5047	0.613769
SANCTIONS	-0.0075	0.0069	-1.0772	0.281401
Multiple R^2	0.364			
Adjusted R^2	0.331			
p-value	1.3533e-12			

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

The model with the dummy variable for sanctions is consistent with the overall results. However, according to the T-test, both firm debt levels and firm discretionary accruals increased after 2014, but this variable is not significant, which did not meet our expectations.

2.2.3. Additional tests

Subsample analysis by economic health

Bankruptcy is also a factor in the analysis of earnings management. There are many studies on this topic, which tell us that firms that are in bad shape and approaching bankruptcy, as well as firms that are already bankrupt, behave in a specific way in matters related to earnings management. Research on the earnings management behavior of failing firms has developed largely over the past decade. In some cases, the findings vary and should be interpreted with caution. In general, the studies can offer empirical evidence of indications that firms use earnings management in the periods leading up to bankruptcy. However, it can be assumed that firms will manage their earnings upward prior to filing for insolvency, but some studies suggest that there are also incentives or factors that may lead to downward earnings management. In addition, there are differences between outcomes during each period prior to bankruptcy. Therefore, the issue of

timing is a very important factor within this study. The identification of earnings management behavior should take into account that accrual reversals will occur as an inherent cause of accounting standards, which can lead to distorting effects.

Many studies in this area already emphasize that there are mixed results in the literature about accounting behavior during periods of distress. Knowledge about the behavior of earnings management in periods leading up to bankruptcy is important for all stakeholders. For example, Kallunki and Martikainen (1999) studied Finnish bankrupt firms and assessed upward earnings management in the three years before bankruptcy. They also discuss the usefulness of knowledge of earnings management behavior for bankruptcy prediction models. They conclude that upward earnings management is an important variable for predicting financial collapse. In other studies, however, earnings management is estimated downward prior to the bankruptcy event (Dutzi, 2016).

Researchers note the significance of bankruptcy factor and bankruptcy risk in EM analysis. The results vary from study to study, but it is clear that bankruptcy affects the earnings management of companies, so in this research it was decided to do additional testing on subsamples to see what the results would be for companies that are in bankruptcy and those that are in a healthy state. It is interesting to see if the dependence of discretionary accruals with other variables would persist if the companies were separated with accordance with this criterion.

It was decided to use the Altman model to determine bankruptcy because it is the most commonly used model. Since we are dealing with public companies that trade on the Moscow Stock Exchange, the Altman five-factor model (Z-Score Model) on Russian companies is specifically used for calculations. The model is as follows:

$$Z = 1{,}2X_1 + 1{,}4X_2 + 3{,}3X_3 + 0{,}6X_4 + X_5, \quad (4)$$

where

X_1 = working capital / total assets

X_2 = retained earnings / total assets

X_3 = earnings before interest and taxes / total assets

X_4 = market value of equity / total liabilities

X_5 = sales / total assets

Zones of discrimination:

$Z > 2.9$ – "safe" zone

$1.81 < Z < 2.9$ – "grey" zone

$Z < 1.8$ – "distress" zone

The prediction probability of this model on the horizon of one year is 95%, two years - 83%. The main disadvantages of the model are that it can be considered only in relation to large companies that have placed their shares on the stock market. However, our sample meets this criterion.

The combination of various financial coefficients and cash flow characteristics were considered in many works as indicators of possible default on payment obligations. One of the first works on statistical analysis pointed out that the most accurate method of predicting defaults contained the calculation of the default risk rating for firms (known as the Z-score) by some financial coefficients calculated for the firms and it is mentioned above (Sharpe, 1999).

Every firm with a Z-score below 1.8 is considered a very likely candidate for bankruptcy, and the lower the Z-score, the higher the probability. Thus, our data were divided into observations with a Z-score above 1.8 and below 1.8, respectively, and according to this criterion were divided into sub-samples. Specification does not include industry factor. There were 668 observations with a Z-score below or equal to 1.8, the remaining 889 observations are attributed to healthy companies.

Table№12 Estimates for observations in healthy conditions (Z > 1,8)

DACC	**Coefficient**	**Std. Error**	**t-value**	**Pr(>| t |)**
Intercept	0,3243	0,05244	6,068	1,83e-09***
TD	0,07635	0,0166	2,581	5,22e-05***
ROA	-0,0886	0,0414	2,139	0,0327*
SIZE	-0,0087	0,0021	-4,143	3,72e-05***
INTEXP	-0,0785	0,0652	-1,163	0,2451
GROWTH	0,0125	0,0067	1,866	0,062
Multiple R^2	0.3671			
Adjusted R^2	0.3194			
p-value	3,71e-09			

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Table№13 Estimates for observations under distress (Z < 1,8)

DACC	Coefficient	Std. Error	t-value	Pr(>| t |)
Intercept	0,2044	0,0852	2,398	0,0168*
TD	0,0237	0,0229	1,036	0,3007
ROA	-0,1108	0,0543	-2,038	0,0420*
SIZE	-0,0032	0,0852	-1,002	0,3169
INTEXP	0,0615	0,2122	0,290	0,7718
GROWTH	0,0157	0,0080	1,960	0,0505.
Multiple R^2	0.0239			
Adjusted R^2	0.0161			
p-value	0,00944			

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

The total debt coefficient is positive as expected according to our main hypothesis and according to our results. It is significant in normal companies, which is consistent with the overall sample. Overall, the sample with healthy companies is broadly consistent with our general data results and satisfies our expectations for the main variables. The low Z-score observation model, on the other hand, explains little of the reality; we see a significantly lower R-squared and virtually all of the variables are not significant except ROA.

Subsample analysis by grouped industries

Among the industries can be observe varying levels of earnings management, so it was decided to do additional testing among grouped industries.

I have allocated groups of the following composition:

- Extraction and distribution of basic resources (92 companies);
- Communications (15 companies);
- Production and manufacturing (56 companies);
- Personal use and consumption (10 companies).

Extraction and distribution of basic resources includes Production and distribution of electricity, gas and water, Extraction and production of basic resources, Chemical industry and Mining of oil and gas. Communication includes Telecommunication, Media goods and services, Information and communication technology and Tourism. Production and manufacturing includes Production of industrial goods and services, Food and beverage industry, Construction and production of building materials, Production of cars and spare parts and Production of personal and household goods. And Personal use and consumption includes Retail industry, Goods and services for health care and Real estate.

For each subsample multiple linear regressions were used. According to the evaluations of the basic models, a Random Effect Model was used.

Table №14 Estimates for Extraction and distribution of basic resources subgroup

DACC	Coefficient	Std. Error	t-value	Pr(>| t |)
Intercept	0,2689	0,08224	3,2701	0,001**
TD	0,00230	0,0220	1,0444	0,2962
ROA	0,0239	0,0519	0,4605	0,6451
SIZE	-0,0054	0,0030	-1,7869	0,0739.
INTEXP	0,1025	0,2081	0,4929	0,6221
GROWTH	0,01152	0,0151	0,7623	0,4458
Multiple R^2	0.1738			
Adjusted R^2	0.0574			
p-value	0.1944			
Observations	828			

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Overall, this model does not explain reality well, we can see that it does not fit the results of our basic model. We cannot answer for sure why, but we can assume that the model is not very suitable for this group of industries, because they are financed to a large extent by the state.

Table №15 Estimates for Communications subgroup

DACC	Coefficient	Std. Error	t-value	Pr(>| t |)
Intercept	0.2274	0.1487	1.5289	0.1262
TD	0.0173	0.0361	0.4815	0.6301
ROA	0.0194	0.0261	0.7448	0.4564
SIZE	-0.0033	0.0060	-0.5581	0.5768
INTEXP	-0.2825	0.2323	-1.2160	0.2239
GROWTH	0.0337	0.0184	1.8346	0.0665.
Multiple R^2	0. 0456			
Adjusted R^2	0.0422			
p-value	0.3189			
Observations	126			

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

The model on the subsample by communications is also not particularly informative and is not significant. This can be explained by the fact that the industries of this subsample are not widely represented in our dataset, and because of the small number of observations it is difficult to derive a good model and come to any conclusions.

Table №16 Estimates for Production and manufacturing subgroup

DACC	Coefficient	Std. Error	t-value	Pr(>| t |)
Intercept	0.4374	0.1069	4.0886	4.34e-05 ***
TD	0.0700	0.0261	2.6822	0.0073**
ROA	-0.0803	0.0427	-1.8790	0.0602.
SIZE	-0.0139	0.0044	-3.1233	0.0017**
INTEXP	-0.0371	0.0710	-0.5222	0.6015
GROWTH	-0.0002	0.0002	-0.9760	0.3290
Multiple R^2	0. 280			
Adjusted R^2	0.201			
p-value	0.00011			
Observations	504			

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

We can see that results of this model for Production and manufacturing subgroup are consistent with our basic model. First of all, the models for EM were developed for manufacturing and production companies, since accruals are characteristic of them in the first place. That is why this particular subset is the most consistent with our main model.

Table №17 Estimates for Personal use and consumption subgroup

DACC	Coefficient	Std. Error	t-value	Pr(>| t |)
Intercept	-0.373118	0.265434	-1.4057	0.159816
TD	0.2089	0.0719	2.906	0.0036**
ROA	-0.3161	0.1139	-2.7740	0.0055**
SIZE	0.0198	0.0117	1.6838	0.0922.
INTEXP	1.9449	0.8113	2.397	0.0165*
GROWTH	0.2085	0.0352	5.907	3.472e-09***
Multiple R^2	0.1579			
Adjusted R^2	0.0556			
p-value	< 2.22e-16			
Observations	90			

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Personal use and consumption subsample is for the most part consistent with our basic model. This model has very low descriptive power, as the subsample is poorly represented. One unit increase in total debt would result in 0.21 increase in Earnings Management, so we can conclude that industries from this subsample are more prone to manipulate their earnings with relation to debt, then other industries. Also, for this model sales growth and interest expense are significant, which is not consistent with the basic models. So, for this subset growing firms manipulate their earnings in order to achieve even greater financing and boost their growth more. A high interest rate can lead to a firm's questionable ability to pay its financial expenses, which reduces its chances of entering into new debt obligations.

2.3. Summary

The chapter describes the methodology of the study. The sources and content of the data, as well as the distribution by industry. Will also analyze debt levels before 2014 and after, as well as a T-test of debt levels and discretionary accruals. The analysis shows that the level of debt of Russian companies in general has slightly increased relative to the period before the sanctions. The empirical research model and its variables are also described. Using econometric analysis, the most significant variables of the model that affect earnings management were derived.

Firms with a strong ROA are less likely to use discretionary accruals to manage earnings. Large companies have less motivation to participate in earnings management. They find under more scrutiny and this consequently leads to the fact that they are less likely to engage in such activities, as they want to avoid sanctions and maintain relationships with creditors.

A significant dependance was found between the earnings management and the level of total debt and the short-term debt. While no significant correlation between the level of long-term debt and earnings management was found. This can be explained by the fact that firms face more potential refinancing pressure if they have predominantly short-term debt. This is evident when debt matures and when managers believe there may be problems in obtaining or renewing debt after maturity. To increase the likelihood of extending a debt contract or obtaining new financing, companies have incentives to engage in earnings management to form the appearance of a healthy company, even if this is not at all consistent with reality. Consequently, if a company uses more long-term debt, it is less dependent on banks because there is no need for regular refinancing, hence less need to resort to earnings management and show putative positive performance.

Moreover, in the methodological part were conducted additional tests that helped us to identify that the model will not work for companies that are in bankruptcy or close to financial destress, and that the basic model is most suitable for manufacturing and production companies,

as these companies have accruals more than others and can use them as an instrument to manipulate their earnings.

2.4. Managerial implications

The results of the study can be implied by primarily external users of accounting information. Specifically, this category includes investors and creditors. Therefore, the results are aimed at those who lend to companies, primarily banks. The results of the research will help to understand the nature of the relationships between information which is stated at the financial statements and what can be hidden from the auditors, understand the conditions under which companies manipulate financial information and take this into account when making decisions about entering into debt relations.

Since this topic has not previously been studied in relation to Russian companies, this information will provide some light regarding this phenomenon specifically in relation to the local market and will help in making important strategic decisions before entering into a debt relationship with companies.

It will also provide additional information about the dependence of debt maturity and debt content to assess the likelihood of whether a particular company has resorted to manipulation of earnings or not, which will also help to build relationships with particularly reliable debtors.

Managers of financial institutions can take the results of the study into account when making investment decisions in companies. In particular, when evaluating a company's position and ratings. The capital structure often serves as the basis for investment decisions and is an important factor in the evaluation of a company. Investment institutions are also interested in reliable financial reports, so the fact that there is a significant positive correlation between the level of debt and the level of earnings management can serve as an indicator of the reliability of reporting.

2.5. Limitations of the study

The main objective of the study was to determine the relationship between leverage and earnings management in companies listed on the Moscow Exchange. The study was limited to 173 companies that report under IFRS. There may be limitations related to the adequacy of the data for the selected companies. First, the reliability of the data may be insufficient, as we do not know the extent to which third-tier companies provide correct information. Secondly, for some companies there were several data gaps, not for every year the information was provided. Also, the distribution by industry is very uneven, which prevents us from giving a reliable assessment of the level of earnings manipulation by companies. Also included in the study were years 2011 through 2019, but there were more gaps in the data for the former years, which may also lead to some imbalance in the analysis.

CONCLUSIONS

The main objective of this study was to determine the relationship between level of debt and earnings management in the Russian market. In order to do this, the theoretical framework of the study was described first. The concept of earnings management has been described, and the main motives on the basis of which managers resort to manipulation of earnings have been disassembled. Further, previous studies, both earlier and current ones, were examined.

Most studies have found a positive significant relationship between the level of debt and the level of earnings management. Further consistently with some research, this paper separates total debt, short-term debt, long-term debt and their relation to Earnings Management. This distinction exists because different types of debt may have different levels of monitoring by outside market participants, different purposes and thus different relationships with creditors.

According to the results a significant correlation between the earnings management manipulation and the level of total debt and the level of short-term debt exists. While no significant correlation between the level of long-term debt and earnings management was found.

This is consistent with previous studies and supports the idea that if firms have a high debt level, they face the pressure of debt covenant cost and the managers adopt accounting policies to manipulate earnings in order to report a favorable financial statement. So, they are also involved in increasing AEM to report favorable earnings in order to attract the investors.

These results can be explained by the fact that the level of earnings management depends on the maturity of the debt as firms face potential refinancing pressure if we are talking about short-term debt, EM occurs when the debt matures and when managers believe they need to secure themselves in order to obtain further financing and show better reporting results than they may actually have. To increase the likelihood of extending a debt contract or obtaining new financing, companies have incentives to participate in earnings management. Evidence has been presented that companies are more likely to have high discretionary accruals when their short-term debt increases, meaning that accruals can be managed in anticipation of debt refinancing.

Other than that, the level of short-term debt was positively related to discretionary accruals for firms with low creditworthiness, consistent with financial distress theory. Also, short-term debt creates an incentive for borrowers to defer recognition of bad news through earnings management. This effect of short-term debt is particularly strong in countries with weak legal regimes.

The size of the firm has a negative value which means that larger firms have less incentive to take part in earnings management. It can be explained as they are under greater attentions and monitoring from external control. The relation of ROA to discretionary accruals is negative, which means that firms with a strong ROA are less likely to use discretionary accruals to manage

earnings. No significant relation of discretionary accruals to sales growth and interest expense was found.

Additional tests were also conducted on subsamples to test the basic model of the study. First, using Altman's model, companies close to bankruptcy were identified and thus we divided the total dataset by observation into healthy and distressed ones. And the analysis showed that the model does not work on companies that are in a state of decline. In addition, an analysis was performed on the subsamples by industry, which helped us to find that the results of the overall sample correspond to the subsample with the manufacturing and production industries, which is generally expected, since the models that calculate earnings management are primarily designed for companies in these industries.

A sufficient number of studies have already been conducted on this topic, but for Russia this topic is poorly researched and requires further development. Thus, this study will contribute to the development of the general topic of earnings management for a particular market, as well as supplement the literature on this topic with more specific information for our region. It is also the first report on Russian companies that covers the relationship between debt levels and earnings management.

Also, the evidence presented in this study adds to a relatively new area in the finance literature related to the impact of debt maturity structure on earnings management. Although the increased control and creditor coercion associated with short-term debt has been cited by finance researchers as desirable, this study shows that increased short-term debt can cause short-term negative incentives for firms to manage earnings.

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APPENDIXES

Appendix 1. List of Companies Used

АБРАУ-ДЮРСО, ПАО
АВИАКОМПАНИЯ ЮТЭЙР, ПАО
АВТОВАЗ, АО
АВТОДОР, ГОСУДАРСТВЕННАЯ КОМПАНИЯ
АКРОН, ПАО
АЛРОСА (ПАО), АК
АМЗ, АО
АПТЕЧНАЯ СЕТЬ 36,6, ПАО
АРМАДА, ПАО
АТОМЭНЕРГОПРОМ, АО
АШИНСКИЙ МЕТЗАВОД, ПАО
АЭРОФЛОТ, ПАО
БАШНЕФТЬ, ПАО АНК
БЕЛОН, ОАО
БЕЛУГА ГРУПП, ПАО
ВАСО, ПАО
ВЕРТОЛЕТЫ РОССИИ, АО
ВОЛГА, АО
ВХЗ, ПАО
ВЫМПЕЛКОМ, ПАО
ВЫСОЧАЙШИЙ, ПАО
ГАЗ, ПАО
ГАЗПРОМ НЕФТЬ, ПАО
ГАЗПРОМ, ПАО
ГЕОТЕК СЕЙСМОРАЗВЕДКА, ПАО
ГЛАВНАЯ ДОРОГА, АО
ГМК НОРИЛЬСКИЙ НИКЕЛЬ, ПАО
ГРУППА ЛСР, ПАО
ГРУППА ЧЕРКИЗОВО, ПАО
ДВМП, ПАО
ДГК, АО
ДЕТСКИЙ МИР, ПАО
ДИКСИ ГРУПП, АО
ДИОД, ПАО
ДОРОГОБУЖ, ПАО
ДЭК, ПАО
ЗАВОД КРАСНОЕ СОРМОВО, ПАО
ИЖОРСКИЕ ЗАВОДЫ, ПАО
ИЗМАЙЛОВО, АО ТГК
ИНТЕЛТЕХ, ПАО
ИНТЕР РАО, ПАО
ИРКУТСКЭНЕРГО, ПАО
ИСКЧ, ПАО
КАЗАНЬОРГСИНТЕЗ, ПАО
КАМАЗ, ПАО
КВАДРА, ПАО
КЗФ, ПАО
ККС-ГРУПП, ПАО
КМЗ, ПАО
КОКС, ПАО
КОРПОРАЦИЯ ВСМПО-АВИСМА, ПАО
КОРПОРАЦИЯ ИРКУТ, ПАО

КРАСНЫЙ ОКТЯБРЬ, ПАО ДОК
КРАСФАРМА, ПАО
КРИОГЕНМАШ, ПАО
КТК, ПАО
КУЙБЫШЕВАЗОТ, ПАО
ЛЕВЕНГУК, ОАО
ЛЕНЗОЛОТО, ПАО
ЛЕНТА, ООО
ЛУКОЙЛ, ПАО
ЛЭСК, ОАО
М.ВИДЕО, ПАО
МАГНИТ, ПАО
МЕГАФОН, ПАО
МЕДИАХОЛДИНГ, ПАО
МЕТАФРАКС, ПАО
МЕЧЕЛ, ПАО
МИХАЙЛОВСКИЙ ГОК ИМ. А.В. ВАРИЧЕВА, АО
ММК, ПАО
МОРИОН, ПАО
МОСТОТРЕСТ, ПАО
МОСЭНЕРГО, ПАО
МОЭК, ПАО
МП СВЖД, ООО
МРСК СЕВЕРО-ЗАПАДА, ПАО
МРСК УРАЛА, ОАО
МРСК ЦЕНТРА И ПРИВОЛЖЬЯ, ПАО
МРСК ЦЕНТРА, ПАО
МТС, ПАО
МУЛЬТИСИСТЕМА, ОАО
МУРМАНСКАЯ ТЭЦ, АО
МХК ЕВРОХИМ, АО
НАУКА-СВЯЗЬ, ПАО
НГК СЛАВНЕФТЬ, ПАО
НЗХК, ПАО
НИЖНЕКАМСКНЕФТЕХИМ, ПАО
НИЖНЕКАМСКШИНА, ПАО
НК РОСНЕФТЬ, ПАО
НКХП, ПАО
НЛМК, ПАО
НМТП, ПАО
ННК, АО
НОВАТЭК, ПАО
НОВОШИП, ПАО
НПК, АО
ОАК, ПАО
ОГК-2, ПАО
ОДК-САТУРН, ПАО
ОДК-УМПО, ПАО
ОМЗ, ПАО
ОМСКИЙ КАУЧУК, АО
ПЕРМЭНЕРГОСБЫТ, ПАО
ПО УОМЗ, АО
ПОЛИПЛАСТ, АО
ПОЛЮС, ПАО
ППГХО, ПАО
ПРОТЕК, АО

РАДИОФИЗИКА, ПАО
РАО ЭС ВОСТОКА, АО
РАСПАДСКАЯ, ПАО
РБК, ПАО
РЖД, ОАО
РОСИНТЕР РЕСТОРАНТС ХОЛДИНГ, ПАО
РОСПЕЧАТЬ, АО АГЕНТСТВО
РОССЕТИ ВОЛГА, ПАО
РОССЕТИ ЛЕНЭНЕРГО, ПАО
РОССЕТИ МОСКОВСКИЙ РЕГИОН, ПАО
РОССЕТИ СЕВЕРНЫЙ КАВКАЗ, ПАО
РОССЕТИ СИБИРЬ, ПАО
РОССЕТИ ТЮМЕНЬ, АО
РОССЕТИ, ПАО
РОСТЕЛЕКОМ, ПАО
РУСАЛ БРАТСК, ПАО
РУСАЛ, АО
РУСГИДРО, ПАО
РУСПОЛИМЕТ, ПАО
РУССКАЯ АКВАКУЛЬТУРА, ПАО
САЛАВАТСТЕКЛО, АО
СЕВЕРАЛМАЗ, ПАО
СЕВЕРСТАЛЬ, ПАО
СЕЛИГДАР, ПАО
СИБУР ХОЛДИНГ, ПАО
СИЛОВЫЕ МАШИНЫ, АО
СОВКОМФЛОТ, ПАО
СОЛИКАМСКБУМПРОМ, АО
СУРГУТНЕФТЕГАЗ, ПАО
СФ АЛМАЗ, ПАО
Т ПЛЮС, ПАО
ТАНТК ИМ. Г.М. БЕРИЕВА, ПАО
ТАТНЕФТЬ ИМ. В.Д. ШАШИНА, ПАО
ТАТТЕЛЕКОМ, ПАО
ТГК-1, ПАО
ТГК-14, ПАО
ТГК-2, ПАО
ТМК, ПАО
ТМТП, АО
ТНС ЭНЕРГО ВОРОНЕЖ, ПАО
ТНС ЭНЕРГО ЯРОСЛАВЛЬ, ПАО
ТРАНСКОНТЕЙНЕР, ПАО
ТРАНСНЕФТЬ, ПАО
ТУЛАНЕФТЕПРОДУКТ, ПАО
ТЯЖМАШ, АО
УДМУРТНЕФТЬ, ОАО
УПРАВЛЕНИЕ ОТХОДАМИ-НН, АО
УРАЛКАЛИЙ, ПАО
УРАЛМАШЗАВОД, ПАО
УРАЛХИММАШ, ПАО
УХП, ПАО
ФИЗИКА, ОАО НПО
ФОСАГРО, ПАО
ФСК ЕЭС, ПАО
ХИМПРОМ, ПАО
ЦЕНТРАЛЬНЫЙ ТЕЛЕГРАФ, ПАО

ЦМТ, ПАО
ЧТПЗ, ПАО
ЧЦЗ, АО
ЭНЕЛ РОССИЯ, ПАО
ЭР-ТЕЛЕКОМ ХОЛДИНГ, АО
ЭТАЛОН ЛЕНСПЕЦСМУ, АО
ЮНИПРО, ПАО
ЯКУТСКЭНЕРГО, ПАО
ЯНТАРЬЭНЕРГО, АО

Appendix 2. Modified Jones Model calculations

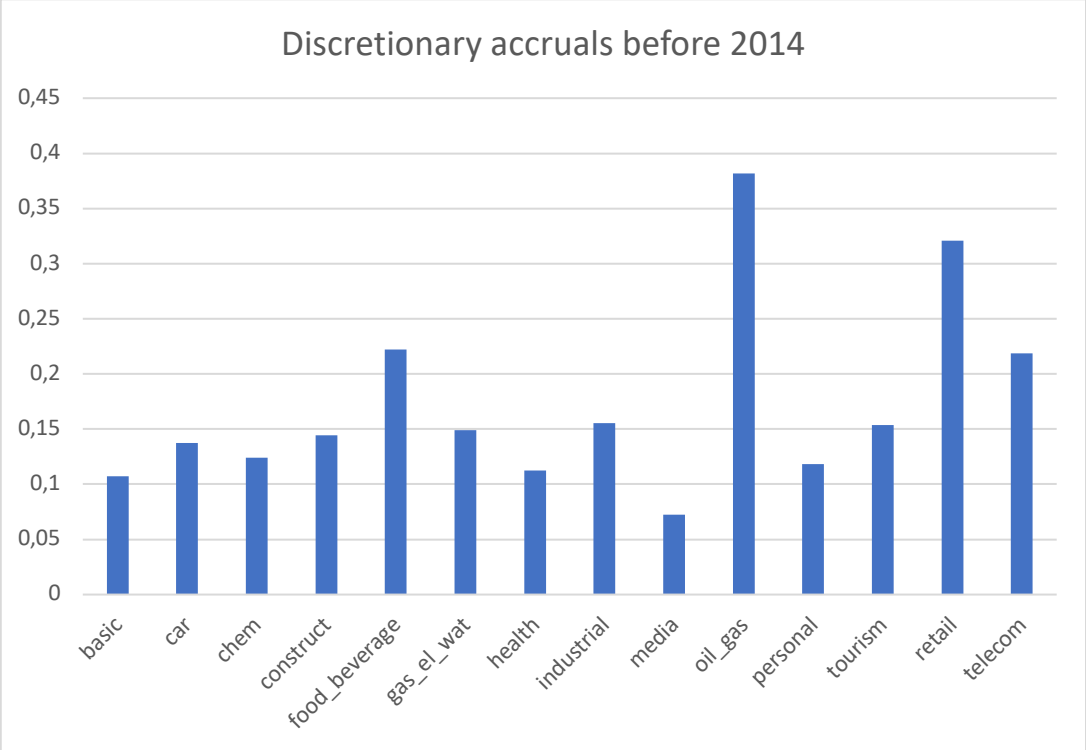
Descriptive statistics

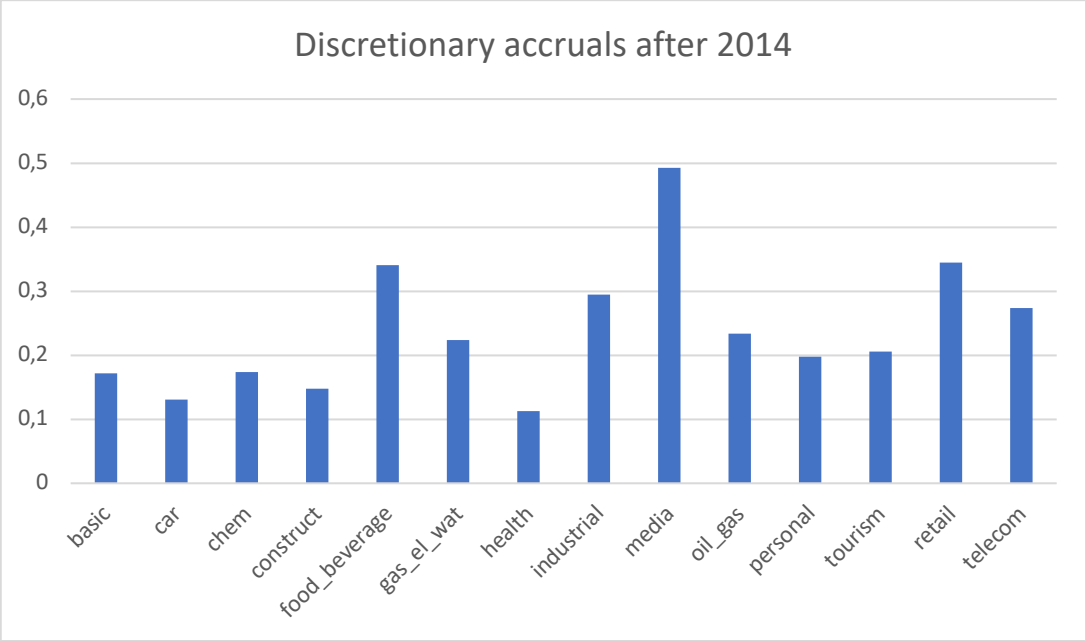
Variable	Mean	St.Dev.	N
TACC(t) / A(t-1)	0,31	8,77	1557
1 / A(t-1)	0,00	0,00	1557
dREV(t)-dREC(t))/A(t-1)	0,63	13,58	1557
PPE / A(t-1)	1,02	15,58	1557

Estimates for the model

TACC(t) / A(t-1)	Coefficient	Std. Error	t-value	Pr(>| t |)
1 / A(t-1)	-12108662,9	0,08224	-0,212	0,832
dREV(t)-dREC(t))/A(t-1)	0,438	0,0220	39,907	0,000
PPE / A(t-1)	0,126	0,0519	0,224	0,000
Multiple R^2	0,73			
Adjusted R^2	0,73			
Std. Error	4,53			
Observations	1557			

Appendix 3. Graphs discretionary accruals before and after sanctions by industry





Appendix 4. Model Justification

Characteristics of the models

Model	**TD**		**STD**		**LTD**	
	p-value	Adj.R^2	p-value	Adj.R^2	p-value	Adj.R^2
Pooling OLS	3.3668e-16	0.042108	5.5952e-09	0.23998	9.4947e-09	0.23376
Fixed Effect Model	1.6782e-09	-0.10125	1.6061e-05	-0.11938	0.0003208	-0.1244
Random Effects Model	5.9884e-13	0.33112	4.3733e-07	0.320418	2.493e-06	0.318381

Test results

Test	**TD**	**STD**	**LTD**
	p-value	p-value	p-value
Lagrange Multiplier Test	< 2.2e-16	< 2.2e-16	< 2.2e-16
F-Test	< 2.2e-16	< 2.2e-16	< 2.2e-16
Hausman Test	0.2007	0.3727	0.5975